

WHAT IS CLAIMED IS:

1. An electronic control unit for a multiple fuel engine utilizing a first fuel and a second fuel, the electronic control unit comprising:
  - a. means for inputting operating characteristics of an engine system to the electronic control unit, wherein at least one of the operating characteristics comprises gas pressure of the second fuel, gas temperature of the second fuel, boost pressure of an intake manifold, or engine coolant temperature; and
  - b. means for controlling amounts of the first fuel and the second fuel for delivery to the multiple fuel engine based on at least one of the operating characteristics.
2. The electronic control unit of Claim 1, further comprising:
  - a. means for determining governing characteristics for multiple fuel operation based on the operating characteristics of the engine system; and
  - b. means for controlling amounts of the first fuel and the second fuel for delivery to the multiple fuel engine based on the governing characteristics.
3. The electronic control unit of Claim 1, wherein the operating characteristics comprise at least two of the operating characteristics selected from the group consisting of gas pressure of the second fuel, gas temperature of the second fuel, boost pressure of an intake manifold, and engine coolant temperature.
4. The electronic control unit of Claim 1, wherein the operating characteristics comprise at least three of the operating characteristics selected from the group consisting of gas pressure of the second fuel, gas temperature of the second fuel, boost pressure of an intake manifold, and engine coolant temperature.
5. The electronic control unit of Claim 1, wherein the operating characteristics comprise at least four of the operating characteristics selected from the group consisting of gas pressure of the second fuel, gas temperature of the second fuel, boost pressure of an engine intake manifold, and engine coolant temperature.
6. The electronic control unit of Claim 1, wherein the at least one operating characteristic comprises the gas pressure of the second fuel.

7. The electronic control unit of Claim 1, wherein the at least one operating characteristic comprises the gas temperature of the second fuel.
8. The electronic control unit of Claim 1, wherein the at least one operating characteristic comprises the boost pressure of the engine intake manifold.
9. The electronic control unit of Claim 1, wherein the at least one operating characteristic comprises the engine coolant temperature.
10. The electronic control unit of Claim 1, wherein the engine system is mechanically governed.
11. The electronic control unit of Claim 10, further comprising means for maintaining a speed of the engine during multiple fuel operation below a higher engine speed during single fuel operation for a given engine throttle position.
12. The electronic control unit of Claim 1, wherein the engine system is electronically controlled.
13. The electronic control unit of Claim 12, further comprising means for communicating with the engine system by a data link.
14. The electronic control unit of Claim 12, wherein the operating characteristics further comprise ambient temperature, ambient pressure, manifold temperature and/or manifold pressure.
15. The electronic control unit of Claim 1, wherein the first fuel comprises diesel.
16. The electronic control unit of Claim 1, wherein the first fuel comprises gasoline.
17. The electronic control unit of Claim 1, wherein the second fuel is gaseous.
18. The electronic control unit of Claim 1, wherein the second fuel comprises natural gas.
19. The electronic control unit of Claim 1, wherein the second fuel comprises propane.
20. The electronic control unit of Claim 1, wherein the second fuel is a liquid.

21. A method for controlling delivery of fuel to a multiple fuel engine utilizing a first fuel and a second fuel, the method comprising:

- a. providing an electronic control unit;
- b. inputting operating characteristics of an engine system to the electronic control unit, wherein at least one of the operating characteristics comprises gas pressure of the second fuel, gas temperature of the second fuel, boost pressure of an intake manifold, or engine coolant temperature; and
- c. controlling amounts of the first fuel and the second fuel for delivery to the engine based on at least one of the operating characteristics.

22. The method of Claim 21, further comprising:

- a. determining governing characteristics for multiple fuel operation based on the operating characteristics of the engine system; and
- b. controlling amounts of the first fuel and the second fuel for delivery to the multiple fuel engine based on the governing characteristics.

23. The method of Claim 21, wherein the engine system is mechanically governed.

24. The method of Claim 23, further comprising maintaining a speed of the engine during multiple fuel operation below a higher engine speed during single fuel operation for a given engine throttle position.

25. The method of Claim 21, wherein the engine system is electronically controlled.

26. The method of Claim 25, further comprising communicating with the engine system by a data link.

27. The method of Claim 25, wherein the operating characteristics further comprise ambient temperature, ambient pressure, manifold temperature and/or manifold pressure.

28. A method for calibrating an electronic control unit for a multiple fuel engine utilizing a first fuel and a second fuel, the method comprising:

- a. inputting operating characteristics of an engine system to the electronic control unit;

b. determining governing characteristics for multiple fuel operation based on the operating characteristics; and

c. controlling amounts of the first fuel and the second fuel for delivery to the engine based on the governing characteristics.

29. The method of Claim 28, wherein at least one of the operating characteristics comprises gas pressure of the second fuel, gas temperature of the second fuel, boost pressure of an intake manifold, or engine coolant temperature.

30. The method of Claim 28, wherein the engine system is mechanically governed.

31. The method of Claim 30, further comprising maintaining a speed of the engine during multiple fuel operation below a higher engine speed during single fuel operation for a given engine throttle position.

32. The method of Claim 28, wherein the engine system is electronically controlled.

33. The method of Claim 32, further comprising communicating with the engine system by a data link.

34. The method of Claim 28, wherein at least one of the operating characteristics comprises ambient temperature, ambient pressure, manifold temperature, or manifold pressure.

35. The method of Claim 28, wherein the first fuel comprises diesel.

36. The method of Claim 28, wherein the first fuel comprises gasoline.

37. The method of Claim 28, wherein the second fuel is gaseous.

38. The method of Claim 28, wherein the second fuel comprises natural gas.

39. The method of Claim 28, wherein the second fuel comprises propane.

40. The method of Claim 28, wherein the second fuel is a liquid.

41. A method for converting an engine system of a vehicle to a multiple fuel engine utilizing a first fuel and a second fuel, the method comprising installing an electronic control unit on the vehicle, wherein the electronic control unit comprises:

a. means for inputting operating characteristics of the engine system to the electronic control unit, wherein at least one of the operating characteristic comprises gas pressure of the first fuel, gas temperature of the second fuel, boost pressure of an intake manifold, or engine coolant temperature; and

b. means for controlling amounts of the first fuel and the second fuel for delivery to the multiple fuel engine based on at least one of the operating characteristics.

42. The method of Claim 41, further comprising mounting a storage tank for the second fuel on the vehicle and installing a second fuel line in flow communication between the storage tank for the second fuel and the engine.

43. A multiple fuel engine system utilizing a first fuel and a second fuel, the multiple fuel engine system comprising an engine, a storage tank for the first fuel, a first fuel line in flow communication between the storage tank for the first fuel and the engine, a storage tank for the second fuel, a second fuel line in flow communication between the storage tank for the second fuel and the engine, and an electronic control unit comprising:

a. means for inputting operating characteristics to the electronic control unit, wherein at least one of the operating characteristics comprises gas pressure of the second fuel, gas temperature of the second fuel, boost pressure of an intake manifold, or engine coolant temperature; and

b. means for controlling amounts of the first fuel and the second fuel for delivery to the multiple fuel engine based on at least one of the operating characteristics.

44. A computer readable medium containing instructions which, when executed by a processor, performs a method for operating a multiple fuel engine utilizing a first fuel and a second fuel, the method comprising:

a. inputting operating characteristics of an engine system to an electronic control unit;

b. determining governing characteristics for multiple fuel operation based on the operating characteristics; and

c. controlling amounts of the first fuel and the second fuel for delivery to the engine based on the governing characteristics.

45. The computer readable medium of Claim 44, wherein at least one of the operating characteristics comprises gas pressure of the second fuel, gas temperature of the second fuel, boost pressure of an intake manifold, or engine coolant temperature.